

Application. No. 10/072,592
Amendment dated March 15, 2004
Reply to Office Action of January 11, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 - 8 (canceled)

Claim 9 (currently amended): A solder configuration, comprising a pad having a surface characterized as substantially completely non-planar and circuitous and adapted to receive solder, thereby forming a solder boundary portion of a solder joint, said non-planar and circuitous surface being disposed within an intermetallic region encompassing said surface of said pad and said solder whereby a crack forming in said solder proximate a said solder boundary with said intermetallic region is influenced to proceed in a direction substantially parallel to said non-planar and circuitous surface, thereby lengthening its travel, and preventing failure increasing fatigue life of said solder joint.

Claim 10 (currently amended): A solder configuration, comprising a pad having a surface characterized as a substantially completely non-planar, serpentine surface adapted to receive solder, thereby forming a solder boundary portion of a solder joint, said solder boundary defining non-planar and serpentine surface being disposed within an intermetallic region encompassing said surface of said pad and said solder extending therefrom and penetrating both said solder and said pad, whereby a crack forming in said solder proximate a said solder boundary with and within said intermetallic region in said solder is influenced to proceed in a direction substantially parallel to said non-planar and serpentine surface along a non-planar, serpentine path,

thereby lengthening its travel, and preventing failure
increasing fatigue life of said solder joint.

Claim 11 (withdrawn): A solder configuration, comprising a pad having a surface upon which an intermetallic boundary interface is disposed, said intermetallic boundary interface defining a separation between said pad and solder that forms part of a solder joint, said intermetallic boundary interface being characterized as non-planar and having a plurality of steps, whereby a crack forming in said solder is influenced to proceed along said interface with a non-planar, stepped path, thereby lengthening its travel, and preventing failure of said solder joint.

Claim 12 (withdrawn): A solder configuration, comprising a pad having a surface upon which an intermetallic boundary interface is disposed, said intermetallic boundary interface defining a separation between said pad and solder that forms part of a solder joint, said intermetallic boundary interface being characterized as non-planar and having a plurality of concentric interruptions, whereby a crack forming in said solder is influenced to proceed along said interface with a non-planar, interrupted path, thereby lengthening its travel, and preventing failure of said solder joint.

Claim 13 (withdrawn): A solder configuration, comprising a pad having a surface upon which an intermetallic boundary interface is disposed, said intermetallic boundary interface defining a separation between said pad and solder that forms part of a solder joint, said intermetallic boundary interface being characterized as non-planar and having a plurality of interdigitated interruptions, whereby a crack forming in said solder is influenced to proceed along said interface with a non-planar, interrupted path, thereby lengthening its travel, and preventing failure of said solder joint.

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Claim 14 (withdrawn): A solder configuration, comprising a pad having a surface upon which an intermetallic boundary interface is disposed, said intermetallic boundary interface defining a separation between said pad and solder that forms part of a solder joint, said intermetallic boundary interface being characterized as non-planar and having a cross-shaped interruption, whereby a crack forming in said solder is influenced to proceed along said interface with a non-planar, interrupted path, thereby lengthening its travel, and preventing failure of said solder joint.

Claim 15 (new): A solder configuration comprising:

- a) a pad having a surface characterized as substantially completely non-planar and circuitous and adapted to receive solder;
- b) solder applied to said surface thereby forming a solder joint therewith; and
- c) an intermetallic region formed adjacent said surface and penetrating into both said pad and said solder adjacent said surface of said pad, said intermetallic region following a path having a shape substantially identical to said non-planar and circuitous surface such that a crack forming proximate said surface of said pad and within said intermetallic region is influenced to proceed in a direction substantially parallel to said non-planar and circuitous surface, thereby lengthening its travel, and increasing fatigue life of said solder joint.

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Claim 16 (new): A surface mounting attachment system utilizing a solder bead for attaching an electrical component to a solder pad on a substrate, the improvement comprising: a solder pad on said substrate having a surface characterized as substantially completely non-planar and circuitous and adapted to receive solder, such that when solder is applied thereto so as to form a solder joint, any crack in said solder proximate said surface of said solder pad is influenced to proceed along a path substantially conforming to said non-planar and circuitous surface, thereby lengthening its travel, and preventing failure of said solder joint.

